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ABSTRACT

A project at the ERIC Clearinghouse on Information Resources has resulted in the extension of the ERIC database to microcomputer. Small subject-related files for current-awareness purposes are downloaded from the ERIC tapes and are made available for searching with Apple II Plus microcomputers. Since the target audience for this system is non-online searchers, a user interface has been developed which simplifies searching and uses a formatted screen to guide users through the search process. The small amount of material which can be stored on a 5 and 1/4 inch diskette has been compensated for in part by the subject-matter orientation of the individual discs and in part by providing supplementary programs which permit the contents of the discs to be printed, thus producing a bibliography with extensive indexes. Field-testing of MICROsearch has guided its current endeavors--the provision of record entry program to permit local files to be created which can also be searched with MICROsearch, and the development of a special user interface for teaching searching. (Author)

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MICROSEARCH--A PROJECT TO EXTEND THE ERIC DATABASE TO MICROCOMPUTERS

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Abstract. A project at the ERIC Clearinghouse on Information Resources has resulted in the extension of the ERIC database to microcomputer. Small subject-related files for current-awareness purposes are downloaded from the ERIC tapes and made available for searching with the Apple II Plus microcomputer. Since the target audience for this system is non-online searchers, a user interface has been developed which simplifies searching and uses a formatted screen to guide users through the search process. The small amount of material which can be stored on a 5¼ inch diskette has been compensated for in part by the subject-matter orientation of the individual discs and in part by providing supplementary programs which permit the contents of the discs to be printed, thus producing a bibliography with extensive indexes. Field-testing of MICROsearch has guided its current endeavors--the provision of a record entry program to permit local files to be created which can also be searched with MICROsearch, and the development of a special user interface for teaching searching.

Keywords and phrases. Apple II, ERIC, Information Retrieval, Microcomputers, MICROsearch, APPLE II, User Cordial Interface

INTRODUCTION

As part of an effort to explore the feasibility of making the ERIC database available in small segments for microcomputers, the National Institute of Education in 1981 awarded a contract to the ERIC Clearinghouse on Information Resources at Syracuse University to develop a search system that would be appropriate for a microcomputer. The project carried with it a number of stipulations. Because the APPLE microcomputer is in extensive use in school systems, and because local schools were to be a major setting for such a service, the study was to use the APPLE II Plus microcomputer with the Apple DOS 3.3 Operating System. Because many locations have only one disk drive, a search routine which requires a single drive was deemed desirable. A further stipulation was that the target audience was not online searchers, but rather end-users in educational settings, primarily school librarians and teachers, and possibly students.

A number of decisions were made early on which further defined the project. The software developed was to be written in the Applesoft version of BASIC. Using assembly language seemed a greater investment in time and effort than was warranted in a pilot study, and Applesoft Basic is the computer language prevalent in educational settings with APPLE microcomputers. (To overcome slow response time, the programs developed were later compiled.) A decision was also made to maintain a library file on the diskette which would resemble the records on the ERIC tapes, supplemented by inverted files for searching. This is not the most economical use of space on the discs, but it is the easiest method to use when downloading from the ERIC tapes.

To conserve space on the disc, not all fields were copied from the ERIC tapes. Initially the files included the accession number, title, author, source, indexing record, and annotation. The annotations were later dropped because their presence severely reduced the number of records that could be placed on a diskette.

USER INTERFACE

An area of major concern in software development was the nature of the user interface. The situation in which non-professional searchers were retrieving information from a diskette warranted an approach somewhat different from the traditional search routines represented by the major database vendors. The ability to manipulate large numbers of sets, for example, was probably not necessary, and might well be detrimental. It was decided to opt for a system which permits only three "sets" or "levels" in a search.

Microsearch maintains one "final set" which is increased or decreased by combining with subsequent searchterms. When a search is begun, the searcher enters a particular term, and the system returns the number of hits. The user then has a choice of retaining that set or not. If s/he chooses to keep the results, then that becomes the "final set." A logical operator may then be entered with another searchterm. The system returns the number of hits on the last search term entered, and also the effect of combining the last set entered with the set stored, should the results be kept. This is identified on the screen as TEM (for "TEMporary total"). The user next has the opportunity to keep or discard the last set entered. If s/he keeps the last set, then the TEM--the set which temporarily holds the results of combining those previously stored with the results of the new searchterm--becomes the final set, and the process starts over.

It was also decided that Microsearch would use a formatted screen. In search mode, the screen is divided into an upper and lower part. The upper part of the screen appears in figure 1, and contains the actual search sequence. The very top displays the last term entered and kept, and also the total number of hits retrieved. Below this are three lines: (1) the command line, (2) the searchterm line, and (3) the decision line. When a user begins the search routine, the system automatically begins with the searchterm line, and moves circularly through the decision and command lines back to the searchterm line. Single words entered after FIND are searched in the Basic index; multiple words are searched in the Descriptor Index (an index of keywords selected from The Thesaurus of ERIC Descriptor. To search for authors, single-word descriptors, or major descriptors, the prefixes AU=, DE=, or DE*= are required. Simple truncation is also available.

In the Author Index authors' names are truncated to last name and first initial. This was done in the interest of conserving space, and justified on the grounds that in online searching it is considered good form to truncate an author's name in order to retrieve on the various possible combinations of names and initials which may have been used.

The command line permits entering either a logical operator, or a functional command. The words in the command line, AND/OR/TYPE/BEGIN/STOP do not give the full range of possibilities. The logical

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NOT is available on the system. There is also the command RX which is short for RE-EXECUTE and was included to compensate for the limited storage of the 5¼ inch diskette. The system stores the searchterm and the logical operator for up to 10 searchterms entered for which the results are kept. New diskettes can be inserted in the disc drive, and the search may be re-executed using the stored searchterms and operators. The search will automatically terminate before it will permit a result of ∅ to be kept. At the end of the re-execution, the user is returned to the search screen and may continue the search.

Records for the citations in TOTAL may be displayed on the screen and subsequently queued to a printer if desired, or they may be queued directly to the printer.

The decision line permits the searcher to decide for or against keeping the results of the last search statement. A third possibility is offered in the form of a VIEW function. This is identified on the screen as the /V in KEEP? Y/N/V. Before a user keeps or rejects a set for a new searchterm, s/he may wish to screen it. The VIEW function will bring titles and authors to the screen and permit the set to be modified by keeping or rejecting individual titles. Upon termination of the VIEW function, the effect of the selections upon the TEM is returned to the screen and the user is given a final opportunity to keep or reject the results.

The bottom half of the search screen is used for two purposes. Normally it is used for a Help function -- to display six "pages" of very pithy instructions. It is also used for the VIEW function available in the decision line.

THE DATABASE DISKETTES

It is not possible to describe MICROsearch and without addressing the limitations of the 5¼ inch diskette. By the time space is reserved on each diskette for the necessary inverted files, there is room for only between 200 and 300 records per disk. Obviously it would not make sense to attempt to download the entire database to diskette. It was hoped, prior to the fieldtesting, that it would be feasible to download records matched to a user profile. For example, records from Current Index to Journals in Education (CIJE) would match the journal holdings of particular libraries. Even this caused information on any particular topic to be spread so thinly over many diskettes that users were frustrated by the low number of relevant citations retrieved.

It now appears that the most appropriate function MICROsearch can serve is as a current awareness tool in particular subject areas. For example, an entire calendar quarter of ERIC in Educational Technology will fit on two discs. By permitting users to make an initial subject area selection in terms of which discs are searched, the probability of retrieving relevant citations is enhanced.

As disc storage increases, and as more sites invest in hard disc drives, the problem of such small numbers will become less of a problem. In the meantime, provision has been made for those who wish to have the contents of the database discs in printed as well as machine-readable form. Supplementary programs permit users to print the contents of the discs, converting them into an extensive bibliography with very thorough indexes.

FIELD TESTING

Before the software for MICROsearch was released in the spring of 1982, it was field-tested in three school settings, at professional meetings attended by staff from the ERIC Clearinghouse on Information Resources, and at the Clearinghouse. Data gathered from about 50 users (including teachers, students, librarians, and university faculty) indicated a positive reaction to the formatted screen, a negative reaction to the small number of citations per disk. It was observed that more experienced searchers tended to "run on ahead" of the screen and enter Boolean

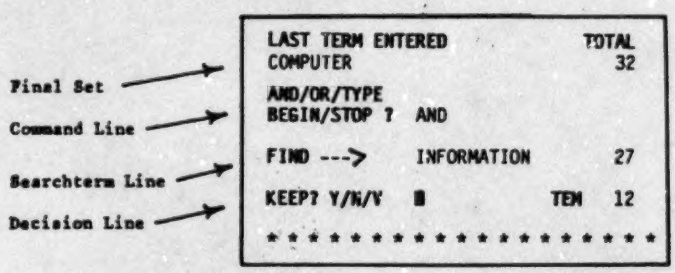

Figure 1. Search Screen for ERIC Microsearch.

operators and searchterms as single strings. As a result MICROsearch was modified to accommodate this. Also the commands **FIND** and **SHOW** were substituted for **SEARCHTERM** and **TYPE**.

While the reaction to the search screen was generally positive, the reaction to tailoring the database discs to individual holdings proved to be unsatisfactory. Users were frustrated having subject matter scattered over many discs, and the field test sites simply stopped using it after the novelty wore off.

As a result of this experience, the strategy for deriving appropriate contents for the discs was altered to the selection of current material in particular subject areas--a quarterly current awareness service.

CURRENT ENDEAVORS

The field-testing, together with feedback from those who have acquired a MICROsearch demonstration package, has indicated two needs which are currently being addressed. One is the desire of field test sites to be able to create local files which match the ERIC records and can be searched with the same program. A simple record entry program which was developed early in the project for internal use is being modified and will be made generally available for local use with MICROsearch. However, the ability to enter local records and create the necessary inverted files using the APPLE II does require a system with two disc drives.

A second need has come as the result of field-test sites using MICROsearch to teach searching. It seems desirable to develop an interface designed to facilitate learning to search. This implies that varying degrees of user control be provided so that, as the searcher becomes more adept, the computer exercises less control over the search. It moves from a fill-in-the-blank type system to a parametric one in which commands and searchterms are entered in single strings after a prompt. It suggests also that the Boolean operators should initially be buried in language that is easily handled by the novice. The development of this interface is currently under way, and the beginners' format appears in figure 2.

IN SUMMARY

MICROsearch, with its formatted screen and limited, subject-oriented database discs does show promise of fulfilling its goal of extending the ERIC database to microcomputer, at least as a current-awareness service. Unanticipated by-products include a new tool for teaching searching and a local record entry program.

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DISC ID: Educational Technology 82-1

Command

Find ---> INFORMATION                75

Keep?     Y                  TEM     53

        Total Retrieved               53

   Too Many <--- ■ ---> Too Few

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Terms Used:
          COMPUTERS


  Enter <---, ---> or RETURN
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Figure 2. User Interface under Development